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In Situ Snow Measurements: Snow Depth and SWE



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Issues

- Sparse networks in the north...no big surprise
- How representative are point SOG observations to the landscape?
- Other issues: What you don't know can't hurt you...right??



Reference Climate Stations

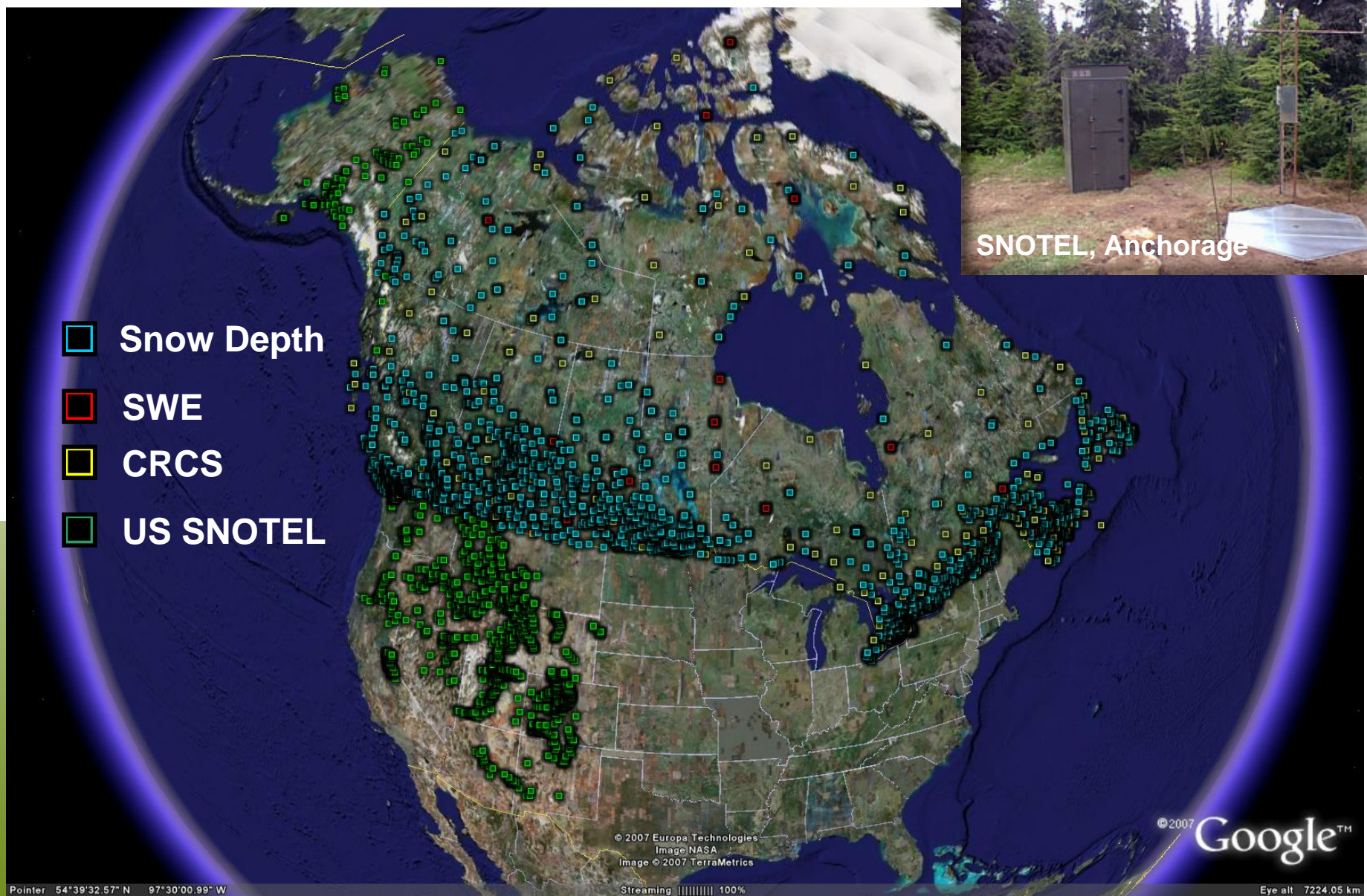
- ~300 automated stations
- Snow depth via SR50



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Eye alt 5528.71 km

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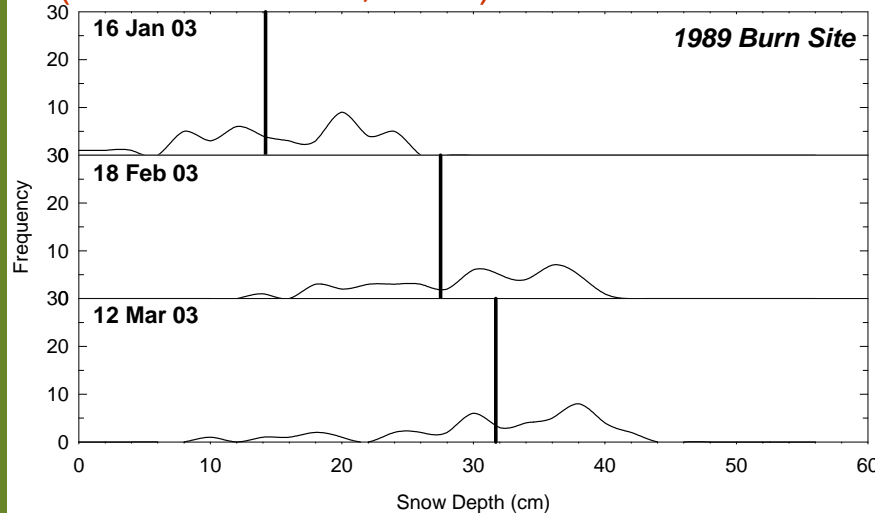


SNOTEL, Anchorage

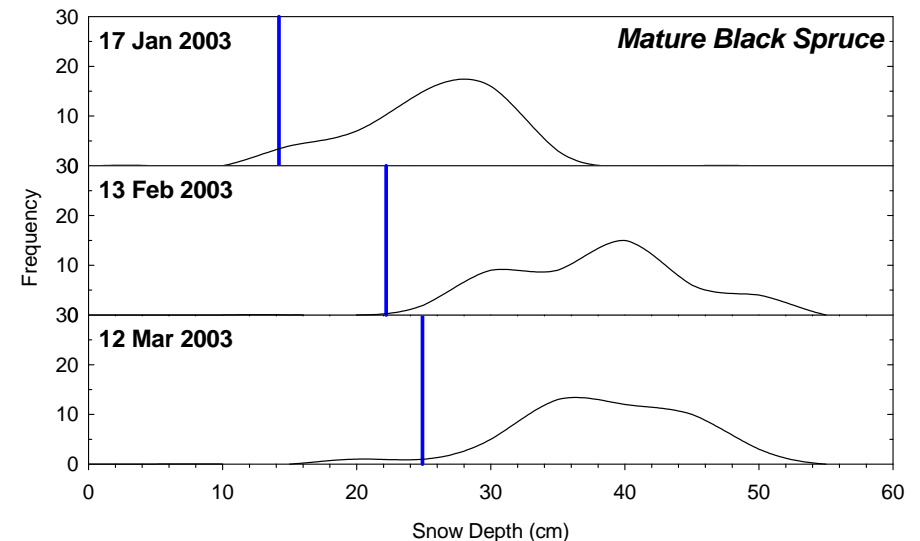


How representative is a single point snow depth to the spatial average?

(Neumann et al., 2006)



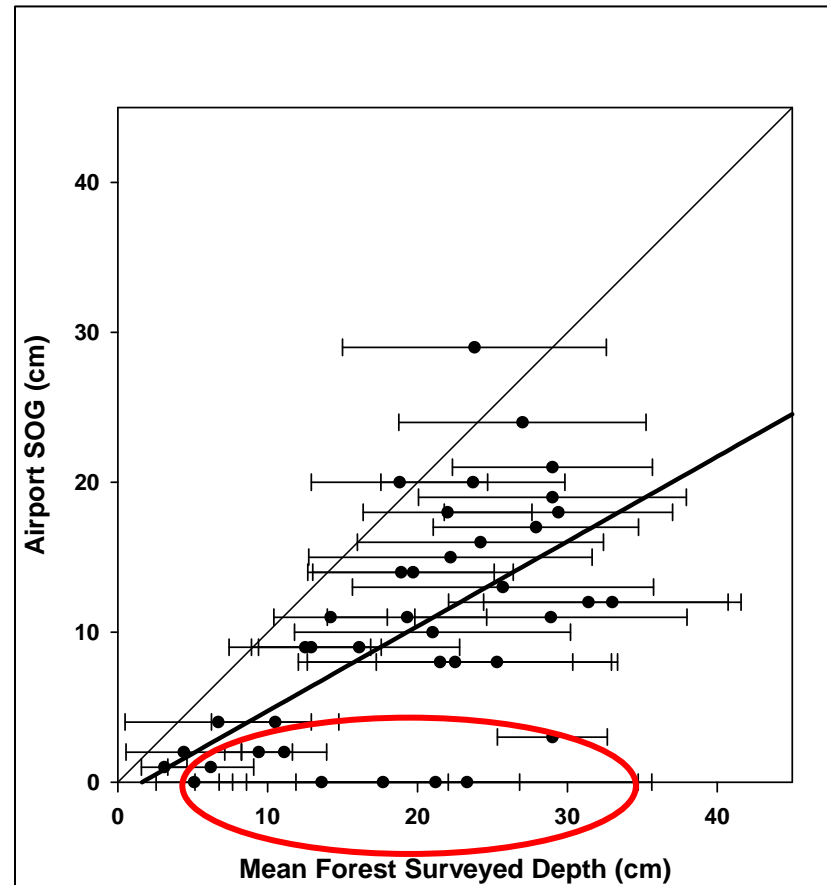
Consistently similar to landscape mean



Consistently under-represents the landscape mean

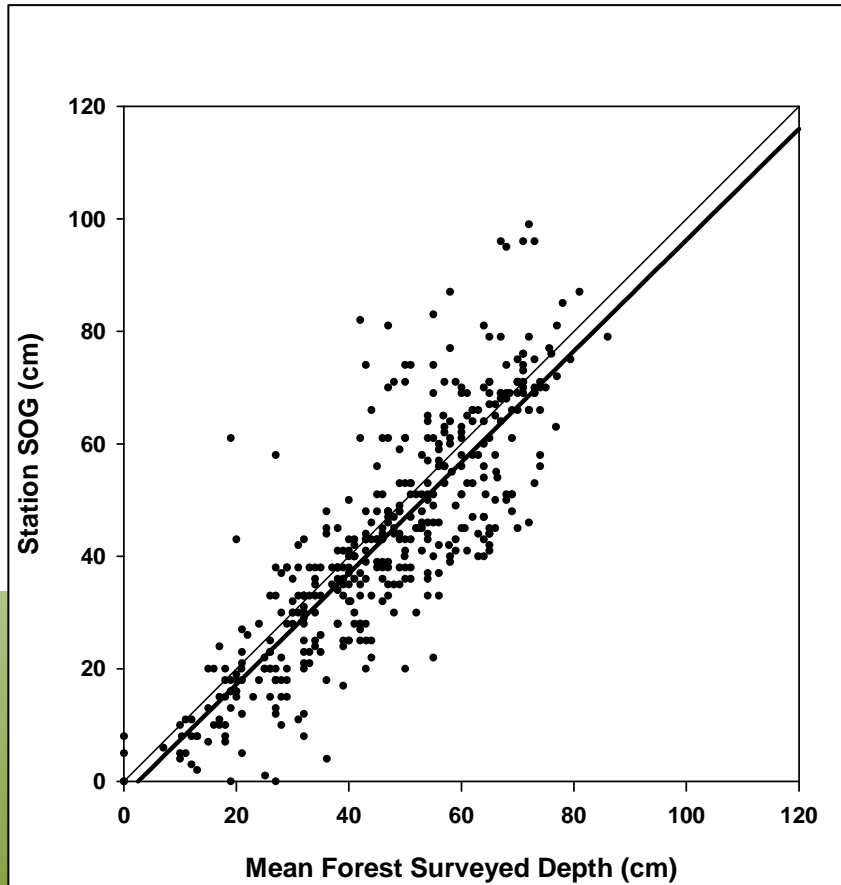
There is a consistent relationship between point depth measurements and the landscape mean depth, that is unique to each site.

Prince Albert Airport: point SOG vs. surveyed SOG

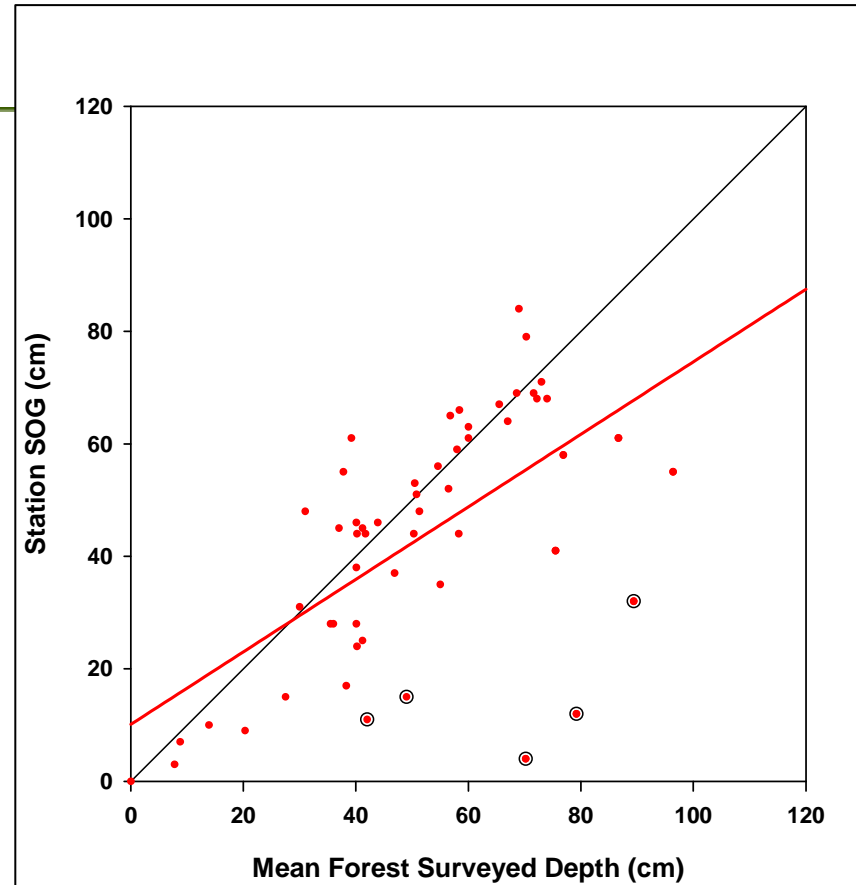


(Smith and Neumann, 2005)

Inuvik: point SOG vs. surveyed SOG



Pre-1995: point SOG and survey at airport, good agreement



Post-1995: point SOG moved to upper-air site, underestimation and earlier melt

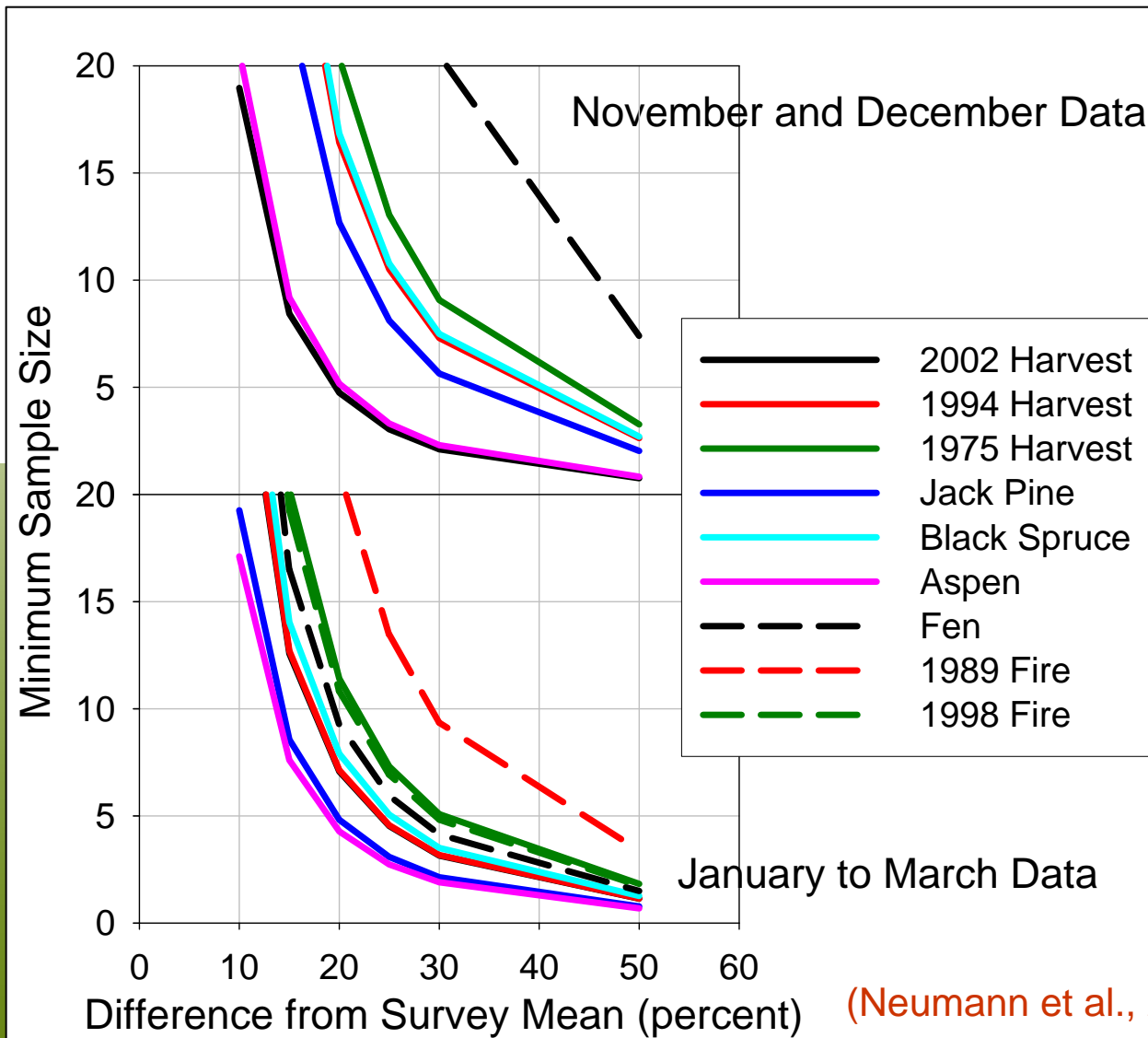
(Smith and Neumann, 2005)



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How many points are needed to be representative?



At most sites, 5 point measurements would represent the landscape mean within 25%

(Neumann et al., 2006)

Other Issues that we are not always aware of:



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Other issues (cont.):



Thank you!

